TABLE FS-3a
Total Cost Summary Table
No Further Action with Monitored Natural Attenuation
002-10261-00

LABOR & DIRECT COSTS:			**Alternative 1**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
No Further Action					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
System Design and Engineering	5%	LS	1	$1,206	
Permitting					
Well Installation - GW Monitoring	$1,755.00	LS	1	$1,755	
No Further Action					
Well Installation	$1,375.00	well	10	$13,750	
Driller Mob. & Decon.	$375.00	day	4	$1,500	
Drums	$45.00	drum	5	$225	
Drum & Soil Disposal (non-haz)	$100.00	drum	5	$500	
Laboratory Analysis (Drum Profile)	$150.00	drum	5	$750	
Sub-total					**$22,186**
Monitored Natural Attenuation					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$29,020	
Permitting					
Well Abandonment	$275.00	well	27	$7,425	
Groundwater Monitoring					
Drums	$45.00	drum	810	$36,450	
GW Disposal (non-haz)	$65.00	drum	810	$52,650	
Laboratory Analysis	$150.00	well	1080	$162,000	
Groundwater Monitoring Well Abandonment	$28.00	well	27	$756	
LFR Field Activities	$241,920.00	LS	1	$241,920	
Sub-total					**$533,721**
Reporting					
Installation Report	$2,500.00	report	1	$2,500	
Semi-annual	$3,500.00	report	40	$140,000	
Post Remediation	$7,500.00	report	1	$7,500	
Site Closure	$10,000.00	report	1	$10,000	
Sub-total					**$160,000**
Project Management					
Project Oversight and Coordination	10%	LS	1	$71,591	
Sub-total					**$71,591**
TASK SUB-TOTALS					**$787,498**
Indirect Reimbursable Expenses Cost Mark Up (10%)					**$78,750**
Communication Fee (2.4%)					**$18,900**
PROJECT SUB-TOTAL					**$885,147**
CONTINGENCY COST - 30%					**$265,544**
TOTAL PROJECT COST					**$1,150,692**

Assumptions

No Further Action
Remedial Action Preparation
1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting
1. GW monitoring wells permits are $333 for the first well and $158 for each additional well. It is assumed that 10 additional wells will be installed for GW monitoring.

No Further Action
1. Each well installation produce 0.5 drums of non-hazardous soil for disposal.
2. Each drum requires profiling prior to disposal.

Monitored Natural Attenuation
Remedial Action Preparation
1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting
1. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Groundwater Monitoring
1. Monitored natural attenuation is estimated to continue for 20 years.
2. Groundwater monitoring will continue for 20 years.
3. A total of 27 groundwater monitoring wells will be monitored.
4. Each well will produce approx. 0.75 drums of purge water for non-haz. disposal.
5. Each drum requires profiling prior to disposal.
6. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for 4.5 days.

Reporting
1. An installation report will be submitted to the appropriate agencies.
2. Semi-annual treatment system and groundwater monitoring reports will be submitted to the appropriate agencies.
3. A post-remediation reporting will be submitted to the appropriate agencies.
4. A site closure report will be submitted to the appropritae agencies upon completion of remediation.
5. All report will be submitted to the appropriate agency after review from clients.

Project Management
1. Includes client interface, cost tracking, RWQCB and SCAQMD interface, overall coordination and scheduling, budgeting, and sub contractor management. Estimated at 10% of project cost.

TABLE FS-3b
Total Cost Summary Table
Alternative 2 - Groundwater Air/Ozone Sparging; In-situ SVE; Hazardous Soil Excavation and Disposal, Affected Soil Capping, Fencing and Deed Restrictions
002-10261-00

LABOR & DIRECT COSTS:			**Alternative 2**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Groundwater Air/Ozone Sparging and In-situ SVE					
Remedial Action Preparation					
Workplan Preparation - Pilot Testing	$2,500.00	LS	1	$2,500	
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	15%	LS	1	$92,015	
Underground Utility Locator	$1,800.00	day	1	$79,835	
Treatment Compound & Manifold	$8,000.00	LS	1	$8,000	
Permitting					
Well Installation - AS/SVE Dual Nested Wells	$18,029.00	LS	1	$18,029	
AS/SVE - VCAPCD Permit	$5,000.00	LS	1	$5,000	
Well Abandonment	$275.00	LS	113	$31,075	
Pilot Testing - AS/SVE					
AS/SVE System Equipment (incl. mob./de-mob.)	$4,956.00	LS	1	$4,956	
1000 lb. Carbon Vessel - Rental	$2,050.00	LS	1	$2,050	
Carbon Removal and Treatment	$1,060.00	LS	1	$1,060	
Carbon Profile (assumes haz)	$270.00	LS	1	$270	
Laboratory Analysis	$175.00	well	8	$1,400	
Well Installation	$750.00	well	8	$6,000	
Drums and Soil Disposal (non-haz.)	$145.00	drum	4	$580	
Piping and Connections	$35.00	foot	350	$12,250	
Generator	$200.00	day	7	$1,400	
LFR Field Activities	$4,256.00	LS	1	$4,256	
AS/SVE					
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
1000 lb. Carbon Vessel	$3,500.00	LS	2	$7,000	
Mob., Inst., 7-Day Mon., & Samp.	$8,920.00	LS	1	$8,920	
Equipment Service	$250.00	month	12	$3,000	
Carbon Initial Fill	$1,000.00	vessel	2	$2,000	
Turn Key Carbon: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	8	$16,000	
Carbon Profile (non-haz)	$360.00	change	8	$2,880	
Driller Mob. & Decon., & Limited Access	$625.00	day	7	$4,375	
AS/SVE Well Installation (Dual Nested)	$750.00	well	113	$84,750	
Drum & Soil Disposal (non-haz)	$100.00	drum	29	$2,900	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$1,500.00	month	12	$18,000	
AS/SVE Conveyance Pipe and Fittings	$35.00	foot	2825	$98,875	
Laboratory Analysis	$150.00	sample	452	$67,800	
Laboratory Analysis VCAPCD	$150.00	sample	24	$3,600	
AS Air Compressor Skid	$35,000.00	LS	1	$35,000	
Well Abandonment	$28.00	well	113	$3,164	
LFR Field Activities	$18,512.00	LS	1	$18,512	
Sub-total					**$705,452**
Hazardous Soil Excavation and Disposal					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$41,495	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
SVE - VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
De-watering Permit (NPDES)	$5,000.00	LS	1	$5,000	
Hazardous Soil Excavation and Disposal					
De-watering	$100,000.00	LS	1	$100,000	
Clear and Grub	$310.00	acre	1.1	$341	
Contaminated Soil Excavation	$5.00	cy	5000	$25,000	
Soil Disposal - RCRA Haz.	$133.00	cy	3750	$498,750	

LABOR & DIRECT COSTS:			**Alternative 2**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Soil Disposal - non-RCRA Haz.	$55.00	cy	1250	$68,750	
Clean Imported Soil and Replacement	$15.00	cy	5000	$75,000	
LFR Field Activities	$7,120.00	LS	1	$7,120	
Sub-total					**$831,756**
Affected Soil Capping					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$321,012	
Permitting					
Grading Permit	$5,000.00	LS	1	$5,000	
Soil Capping					
Clear and Grub	$310.00	acre	60	$18,600	
Clean Imported Cap Material and Replacement	$15.00	cy	290400	$4,356,000	
Confirmation Sampling	$125.00	sample	60	$7,500	
Revegetation	$32,000.00	acre	60	$1,920,000	
LFR Field Activities	$109,648.00	LS	1	$109,648	
Sub-total					**$6,741,260**
Fencing and Deed Restrictions					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$36,479	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
Permit to Construct	$5,000.00	LS	1	$5,000	
Fencing and Deed Restrictions					
Milk Vetch Area Fencing	$55.00	ft	1100	$60,500	
Site Fencing	$55.00	ft	9875	$543,125	
Deed Restrictions	$100,000.00	LS	1	$100,000	
LFR Field Activities	$15,664.00	LS	1	$15,664	
Sub-total					**$766,068**
Monitored Natural Attenuation					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$7,435	
Permitting					
Well Installation - GW Monitoring	$1,375.00	well	10	$13,750	
Well Abandonment	$275.00	LS	27	$7,425	
Groundwater Monitoring					
Drums	$45.00	drum	202.5	$9,113	
GW Disposal (non-haz)	$65.00	drum	202.5	$13,163	
Laboratory Analysis	$150.00	well	270	$40,500	
Groundwater Monitoring Well Abandonment	$28.00	well	27	$756	
LFR Field Activities	$60,480.00	LS	1	$60,480	
Sub-total					**$156,121**
Reporting					
Installation Report	$2,500.00	report	5	$12,500	
Quarterly	$3,500.00	report	4	$14,000	
Semi-annually	$4,500.00	report	10	$45,000	
Post Remediation	$7,500.00	report	5	$37,500	
Site Closure	$10,000.00	report	1	$10,000	
Sub-total					**$119,000**
Project Management					
Project Oversight and Coordination	10%		1	$931,966	
Sub-total					**$931,966**

LABOR & DIRECT COSTS:			**Alternative 2**	**TOTAL**
ITEM	Rate	Units	# of Units Extended	Cost
TASK SUB-TOTALS				**$10,251,623**
Indirect Reimbursable Expenses Cost Mark Up (10%)				**$1,025,162**
Communication Fee (2.4%)				**$246,039**
PROJECT COSTS				**$11,522,824**
CONTINGENCY COST - 30%				**$3,456,847**
TOTAL PROJECT COST				**$14,979,671**

Assumptions

Groundwater Air/Ozone Sparging and In-situ SVE

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.
6. A fenced, bermed, concrete treatment compound will be installed to house remediation equipment.

Permitting

1. Well permits are $333 for the first well and $158 for each additional well. It is assumed that 113 wells will be installed.
2. A VCAPCD equipment operation permit is required for the AS/SVE system.
3. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Pilot Testing - AS/SVE

1. SVE Equipment is rented for the pilot study and includes mob. and demob.
2. Two 1000 pound absorbers will be utilized per VCAPCD permit.
3. Carbon will need to be removed, profiled and treated at conclusion of pilot test.
4. A total of 8 AS/SVE wells will be installed for the pilot test.
5. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
6. Each drum requires profiling prior to disposal.
7. Samples (influent and effluent collected 2X daily) will analyzed via EPA Method during the pilot test.
8. Approx. 350 ft of above ground conveyance piping will be utilized to connect the wells to the system.
9. Power to run the pilot test will be obtained from a rented, portable generator.
10. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for the duration of the pilot testing.

AS/SVE

1. AS/SVE system will be operated for a total of 1 year.
2. SVE equipment needs servicing once per quarter.
3. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
4. A total of 113 new dual nested AS/SVE wells (incl. pilot study wells) will be installed.
5. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
6. Each drum requires profiling prior to disposal.
7. Electricity costs $0.14 per kw-h.
8. The SVE system will run 24 hr. a day, in a 30 day month.
9. Aboveground conveyance piping will be used to connect the wells to the treatment system.
10. Laboratory analysis is based on one well sample per quarter. These will be analyzed via approved EPA Method.
11. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via approved EPA Method.
12. All wells will be abandoned according to regulation after system shutdown.
13. LFR Field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per quarter.

Hazardous Soil Excavation and Disposal

Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting

1. A VCAPCD equipment operation permit is required for the AS/SVE system.
2. NPDES permit is necessary for water discharge.

Hazardous Soil Excavation and Disposal

1. De-watering will be necessary prior to excavation and is based on a lum sum provided by a contractor.
2. The areas excavation will be cleared and grubbed prior to excavation.
3. Soil will be excavated and disposed of at a licensed disposal facility.
4. 75% of excavated soil will be hazardous (for disposal purposes) and 25% will be considered non-hazardous.
5. Clean imported fill will be purchased from offsite and replaced onsite.
6. LFR Field time includes 1 technician for 2 weeks for oversight and sampling.

Affected Soil Capping

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is
4. System design and engineering includes LFR staff time and effort.

Permitting

1. A grading permit is required prior to implementation.

Soil Capping

1. The entire area to be capped will be cleared and grub prior to import of clean cap soils.
2. Clean imported fill cap material will be purchased from offsite and replaced onsite.
3. Confirmation sampling will occur to provide assurance that imported cap material is clean.
4. The site will be re-vegetated with 50% indigineous and 50% non-indigineous plants.
5. LFR field time during operation includes 1 technician for months for oversight and sampling.

Fencing and Deed Restrictions

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting

1. Permits to erect a fence will be obtained prior to installation.

Fencing and Deed Restrictions

1. The permanent fence will consist of 8 ft high chain link fence covered in black vinyl for asthetic purposes.
2. Both the milk vetch protection aarea and the entire site perimeter will be fenced.
3. Deed restrictions will be obtained through proper processes and may require re-zoning of site areas.
4. LFR field time during installaton includes 1 technician for 3 weeks of oversight.

Monitored Natural Attenuation

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting

1. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Groundwater Monitoring

1. Monitored natural attenuation is estimated to continue for 5 years.
2. Groundwater monitoring will continue for 5 years.
3. A total of 27 groundwater monitoring wells will be monitored.
4. Each well will produce approx. 0.75 drums of purge water for non-haz. disposal.
5. Each drum requires profiling prior to disposal.
6. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for 4.5 days.
5. All report will be submitted to the appropriate agency after review from Bodycote.

Reporting

1. An installation report will be submitted to the appropriate agencies.
2. Quarterly and semi-annual treatment system and groundwater monitoring reports will be submitted to the appropriate
3. A post-remediation reporting will be submitted to the appropriate agencies.
4. A site closure report will be submitted to the appropritae agencies upon completion of remediation.
5. All report will be submitted to the appropriate agency after review from clients.

Project Management

1. Includes client interface, cost tracking, RWQCB and SCAQMD interface, overall coordination and scheduling, budgeting, and sub contractor management. Estimated at 10% of project cost.

TABLE FS-3c
Total Cost Summary Table

Alternative 3 - Groundwater Extraction and Treatment, Air Stripping and Vapor Phase Adsorption and Monitored Natural Attenuation; Source Removal, Ex-situ SVE; Hazardous Soil Excavation and Disposal; Affected Soil Consolidation, Bio-treatment and In-situ SVE/Aeration; Affected Soil Capping, Fencing and Deed Restrictions
002-10261-00

LABOR & DIRECT COSTS:			**Alternative 3**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Groundwater Extraction, Air Stripping and Vapor Adsorption					
Remedial Action Preparation					
Workplan Preparation - Pilot Testing	$2,500.00	LS	1	$2,500	
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	15%	LS	1	$108,634	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound & Manifold	$12,000.00	LS	1	$12,000	
Permitting					
Well Installation - GW Monitoring	$1,755.00	LS	1	$1,755	
Air Stripper/Vapor Adsorption - VCAPCD Permit	$5,000.00	LS	1	$5,000	
NPDES Permit	$5,000.00	LS	1	$5,000	
Well Abandonment	$275.00	LS	57	$15,675	
Pilot Testing - Groundwater Extraction					
100 gpm GWETS Skid - Rental	$4,956.00	LS	1	$4,956	
20,000 gal Baker Tank (mob./demob. and rental cost)	$4,000.00	LS	1	$4,000	
1000 lb. Carbon Vessel - Rental	$2,050.00	LS	1	$2,050	
Carbon Removal and Treatment	$1,060.00	LS	1	$1,060	
Carbon Profile (assumes non-haz)	$170.00	LS	1	$170	
Well Installation	$1,375.00	well	6	$8,250	
Drums and Soil Disposal (non-haz.)	$145.00	well	3	$435	
Piping and Connections	$35.00	foot	350	$12,250	
Generator (Rental)	$200.00	day	7	$1,400	
LFR Field Activities and Equipment	$9,472.00	LS	1	$9,472	
Groundwater Extraction, Air Stripping and Vapor Adsorption					
250 gpm GWETS Skid	$10,000.00	LS	1	$10,000	
2,500 gal. Double Wall Poly Tank	$4,600.00	LS	1	$4,600	
Mobilization & Installation (GWETS)	$2,820.00	LS	1	$2,820	
Equipment Service	$250.00	month	12	$3,000	
1000 lb. Carbon Vessel	$3,500.00	vessel	2	$7,000	
Carbon Initial Fill - Air	$1,000.00	vessel	2	$2,000	
Turn Key Carbon - Air: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	4	$8,000	
Carbon Profile - Air (non-haz)	$360.00	change	8	$2,880	
Driller Mob. & Decon.	$375.00	LS	1	$375	
Well Installation	$1,375.00	well	57	$78,375	
Drum & Soil Disposal (non-haz)	$100.00	well	15	$1,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$2,500.00	month	12	$30,000	
Piping and Connections	$35.00	foot	5700	$199,500	
Laboratory Analysis NPDES (Annual)	$5,000.00	LS	1	$5,000	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Air Stripping Tower (Complete Unit)	$125,000.00	LS	1	$125,000	
Mobilization & Installation (Air Stripper)	$12,500.00	LS	1	$12,500	
Vapor Phase Adsorption Reactors (Rental)	$4,000.00	month	12	$48,000	
Vapor Phase Adsorption Matrix	$13,367.00	LS	1	$13,367	
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
Mobilization and Installation	$2,750.00	LS	1	$2,750	
Air Stripping Conveyance Pipe and Fittings	$35.00	foot	100	$3,500	
Laboratory Analysis	$150.00	LS	24	$3,600	
LFR Field Activities and Equipment	$18,512.00	LS	1	$18,512	
Sub-total					**$836,686**
Source Soil Removal and Ex-situ SVE					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	

LABOR & DIRECT COSTS:			**Alternative 3**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
System Design and Engineering	5%	LS	1	$63,174	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound & Manifold	$2,500.00	LS	1	$2,500	
HDPE Liner	$2.00	sq. ft.	128200	$256,400	
Permitting					
VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
VCAPCD SVE System Operation Permit	$5,000.00	LS	1	$5,000	
Source Removal					
Contaminated Soil Excavation	$2.50	cy	189720	$474,300	
Ex-Situ SVE					
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
1000 lb. Carbon Vessel	$3,500.00	LS	2	$7,000	
Mobilization and Installation	$8,920.00	LS	1	$8,920	
Equipment Service	$250.00	month	12	$3,000	
Carbon Initial Fill	$1,000.00	vessel	2	$2,000	
Turn Key Carbon: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	8	$16,000	
Carbon Profile (non-haz)	$360.00	change	8	$2,880	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$1,500.00	month	12	$18,000	
SVE Conveyance Pipe and Fittings	$35.00	foot	900	$31,500	
Laboratory Analysis	$150.00	LS	24	$3,600	
Mobile Laboratory	$300,000.00	LS	1	$300,000	
Soil Replacement	$2.50	cy	18972	$47,430	
LFR Field Activities	$20,160.00	LS	1	$20,160	
Sub-total					**$1,326,664**
Hazardous Soil Excavation and Disposal					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$35,513	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
SVE - VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
Hazardous Soil Excavation and Disposal					
Clear and Grub	$310.00	acre	1.1	$341	
Contaminated Soil Excavation	$5.00	cy	5000	$25,000	
Soil Disposal - RCRA Haz.	$133.00	cy	3750	$498,750	
Soil Disposal - non-RCRA Haz.	$55.00	cy	1250	$68,750	
De-watering	$100,000.00	LS	1	$100,000	
LFR Field Activities	$7,120.00	LS	1	$7,120	
Sub-total					**$745,774**
Affected Soil Consolidation, Biotreatment and In-situ SVE/Aeration					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$220,500	
Permitting					
VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
VCAPCD SVE System Operation Permit	$5,000.00	LS	1	$5,000	
Soil Consolidation, Bio-treatment and In-situ SVE					
Impacted Soil Excavation and Placement	$2.50	cy	416980	$1,042,450	
Bio-treatment Amendments and Nutrients	$6.00	cy	253950	$1,523,700	
Biological Parameters Sampling and Analysis	$250.00	LS	20	$5,000	
Analytical Sampling and Analysis	$150.00	sample	20	$3,000	
Various Soil Movement for Implementation	$1.50	cy	983000	$1,474,500	
500 SCFM Blower Skid	$75,000.00	LS	1	$75,000	
1000 lb. Carbon Vessel	$3,500.00	LS	2	$7,000	
Mobilization and Installation	$8,920.00	LS	1	$8,920	
Equipment Service	$250.00	month	12	$3,000	
Carbon Initial Fill	$1,000.00	vessel	2	$2,000	
Turn Key Carbon: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	8	$16,000	
Carbon Profile (non-haz)	$360.00	change	8	$2,880	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	

LABOR & DIRECT COSTS:			**Alternative 3**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Electrical Usage	$1,500.00	month	12	$18,000	
SVE Conveyance Pipe and Fittings	$35.00	foot	5000	$175,000	
LFR Field Activities	$35,600.00	LS	1	$35,600	
Sub-total					**$4,630,550**
Affected Soil Capping					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$83,728	
Permitting					
Grading Permit	$5,000.00	LS	1	$5,000	
Soil Capping					
Cap Material Placement - Both RPAs	$2.50	cy	279700	$699,250	
Confirmation Sampling	$150.00	sample	50	$7,500	
Re-vegetation	$32,000.00	acre	29	$928,000	
LFR Field Activities	$31,328.00	LS	1	$31,328	
Sub-total					**$1,758,306**
Fencing and Deed Restrictions					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$29,715	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
Permit to Construct	$5,000.00	LS	1	$5,000	
Fencing and Deed Restrictions					
Milk Vetch Area Fencing	$55.00	ft	1100	$60,500	
RPA Area Fencing	$55.00	ft	9250	$508,750	
LFR Field Activities	$14,750.00	LS	1	$14,750	
Sub-total					**$624,015**
Monitored Natural Attenuation					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$7,435	
Permitting					
Well Installation - GW Monitoring	$1,375.00	well	10	$13,750	
Well Abandonment	$275.00	LS	27	$7,425	
Groundwater Monitoring					
Drums	$45.00	drum	202.5	$9,113	
GW Disposal (non-haz)	$65.00	drum	202.5	$13,163	
Laboratory Analysis	$150.00	well	270	$40,500	
Groundwater Monitoring Well Abandonment	$28.00	well	27	$756	
LFR Field Activities	$60,480.00	LS	1	$60,480	
Sub-total					**$156,121**
Reporting					
Installation Report	$2,500.00	report	7	$17,500	
Quarterly	$3,500.00	report	4	$14,000	
Semi-annually	$4,500.00	report	10	$45,000	
Post Remediation	$7,500.00	report	7	$52,500	
Site Closure	$10,000.00	report	1	$10,000	
Sub-total					**$139,000**
Project Management					
Project Oversight and Coordination	10%	LS	1	$1,021,712	
Sub-total					**$1,021,712**
TASK SUB-TOTALS					**$11,238,828**

LABOR & DIRECT COSTS:			**Alternative 3**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Indirect Reimbursable Expenses Cost Mark Up (10%)					**$1,123,883**
Communication Fee (2.4%)					**$269,732**
PROJECT COSTS					**$12,632,442**
CONTINGENCY COST - ***30%***					**$3,789,733**
TOTAL PROJECT COST					**$16,422,175**

Assumptions

Groundwater Extraction, Air Stripping and Vapor Adsorption

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.
6. A fenced, bermed, concrete treatment compound will be installed to house remediation equipment.

Permitting

1. Well permits are $333 for the first well and $158 for each additional well. It is assumed that 113 wells will be installed.
2. A VCAPCD equipment operation permit is required for the Air stripper and vapor adsorption system.
3. NPDES permit is necessary for water discharge.
4. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Pilot Testing - AS/SVE

1. Groundwater extraction equipment is rented for the pilot study and includes mob. and demob.
2. Tanks for water storage is rented for the pilot study and includes mob. And demob.
3. One 1000 pound absorber will be utilized per VCAPCD permit.
4. Carbon will need to be removed, profiled and treated at conclusion of pilot test.
5. A total of 6 groundwater extraction wells will be installed for the pilot test.
6. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
7. Each drum requires profiling prior to disposal.
8. Approx. 350 ft of above ground conveyance piping will be utilized to connect the wells to the system.
9. Power to run the pilot test will be obtained from a rented, portable generator.
10. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for the duration of the pilot testing.

Groundwater Extraction, Air Stripping and Vapor Adsorption

1. Groundwater extraction, stripping and vapor adsorption will occur for a total of 1 year.
2. A groundwater extraction sytem will be purchased and equipment needs servicing once per quarter.
3. A water storage tank will be located on site.
4. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
5. A total of 57 new groundwater extraction wells (incl. pilot study wells) will be installed.
6. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
7. Each drum requires profiling prior to disposal.
8. Electrical usage is based on motor HP and electricity costs approximately $0.14 per kw-h.
9. The SVE system will run 24 hr. a day, in a 30 day month.
10. Aboveground conveyance piping will be used to connect the wells to the treatment system.
11. NPDES laboratory analysis is based on one well sample per quarter. These will be analyzed via approved EPA Method.
12. The sir stripper unit and controls will be all inclusive.
13. Mobilization and installation of the air stripper is estimated at 10% of the cost of the unit.
14. Biological vapor phase adsorption reactors will be rented.
15. A supplemental blower package will be used to distribute air through the vapor treatment system.
16. Aboveground conveyance piping will be used to connect the stripper to the vapor treatment system.
17. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via an approved EPA Method.
18. LFR field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per

Source Soil Removal and Ex-situ SVE

Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to excavation.
6. A treatment compound will be established to accommodate the excavated soil and remediation equipment.
7. The treatment compound will be lined with HDPE liner.

Permitting

1. An excavation permit will be obtained from VCAPCD prior to excavation.
2. A VCAPCD equipment operation permit is required for the ex-situ SVE system.

Source Removal

1. Contaminated soil will be excavated and placed in the treatment area.

Ex-situ SVE

1. The SVE system will be operated for a total of 1 year or until contaminant levels become asymptotic.
2. SVE equipment needs servicing once per quarter.
3. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
4. A total of 113 new dual nested AS/SVE wells (incl. pilot study wells) will be installed.
5. Electrical usage is based on motor HP and electricity costs approximately $0.14 per kw-h.
6. The SVE system will run 24 hr. a day, in a 30 day month.
7. A network of conveyance piping will be used to connect to the treatment system.
8. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via an approved EPA Method.
9. A mobile laboratory will be on-site for confirmation sampling.
10. Soil will be replaced to an appropriate location at the conclusion of ex-situ SVE.
11. LFR field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per

Hazardous Soil Excavation and Disposal

Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting

1. A VCAPCD excavation permit is required.
2. NPDES permit is necessary for water discharge.

Hazardous Soil Excavation and Disposal

1. De-watering will be necessary prior to excavation and is based on a lump sum provided by a contractor.
2. The areas excavation will be cleared and grubbed prior to excavation.
3. Soil will be excavated and disposed of at a licensed disposal facility.
4. 75% of excavated soil will be hazardous (for disposal purposes) and 25% will be considered non-hazardous.
5. Clean imported fill will be purchased from offsite and replaced onsite.
6. LFR Field time includes 1 technician for 2 weeks for oversight and sampling.

Affected Soil Consolidation and Biotreatment

Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.

Permitting

1. An excavation permit will be obtained from VCAPCD prior to excavation.

Soil Consolidation and Biotreatment

1. Impacted soil will be excavated and placed in the soil consolidation area.
2. Nutrients and amendments will be mixed with the soil during excavation. This will also act as vapor suppressant.
3. Biological parameters will be monitored to assess microbiological viability.
4. Sampling will be performed to confirm contaminant reduction.
5. LFR field time during excavation and sampling includes 1 technician for oversight and sampling once per week.

Affected Soil Capping

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.

Permitting

1. A grading permit is required prior to implementation.

Soil Capping

1. The entire area (both RPAs) to be capped will be cleared and grub prior to import of clean cap soils.

2. Clean imported fill cap material will be purchased from offsite and replaced onsite.
3. Confirmation sampling will occur to provide assurance that imported cap material is clean.
4. The capped area will be re-vegetated with 50% indigineous and 50% non-indigineous plants.
5. LFR field time during operation includes 1 technician for 2 months for oversight and sampling.

Fencing and Deed Restrictions

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting

1. Permits to erect a fence will be obtained prior to installation.

Fencing and Deed Restrictions

1. The permanent fence will consist of 8 ft high chain link fence covered in black vinyl for asthetic purposes.
2. Both the milk vetch protection aarea and both RPA perimeters will be fenced.
3. LFR field time during installaton includes 1 technician for 2 weeks of oversight.

Monitored Natural Attenuation

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting

1. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Groundwater Monitoring

1. Monitored natural attenuation is estimated to continue for 5 years.
2. Groundwater monitoring will continue for 5 years.
3. A total of 27 groundwater monitoring wells will be monitored.
4. Each well will produce approx. 0.75 drums of purge water for non-haz. disposal.
5. Each drum requires profiling prior to disposal.
6. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for 4.5 days.
5. All report will be submitted to the appropriate agency after review from Bodycote.

Reporting

1. An installation report will be submitted to the appropriate agencies.
2. Quarterly and semi-annual treatment system and groundwater monitoring reports will be submitted to the appropriate
3. A post-remediation reporting will be submitted to the appropriate agencies.
4. A site closure report will be submitted to the appropritae agencies upon completion of remediation.
5. All report will be submitted to the appropriate agency after review from clients.

Project Management

1. Includes client interface, cost tracking, RWQCB and SCAQMD interface, overall coordination and scheduling, budgeting, and sub-contractor management. Estimated at 10% of project cost.

TABLE FS-3d
Total Cost Summary Table

Alternative 4 - Groundwater Extraction and Treatment, Air Stripping and Vapor Phase Adsorption and Monitored Natural Attenuation; Source Removal and Ex-situ SVE; Affected Soil and Sludge Excavation and Treatment with Sonic Technologies; Affected Soil Consolidation and Bio-treatment; Affected Soil Capping, Fencing and Deed Restrictions
002-10261-00

LABOR & DIRECT COSTS:			**Alternative 4**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Groundwater Extraction, Air Stripping and Vapor Adsorption					
Remedial Action Preparation					
Workplan Preparation - Pilot Testing	$2,500.00	LS	1	$2,500	
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	15%	LS	1	$108,634	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound & Manifold	$8,000.00	LS	1	$8,000	
Permitting					
Well Installation - GW Monitoring	$1,755.00	LS	1	$1,755	
AS/SVE - VCAPCD Permit	$5,000.00	LS	1	$5,000	
NPDES Permit	$5,000.00	LS	1	$5,000	
Well Abandonment	$275.00	LS	57	$15,675	
Pilot Testing - Groundwater Extraction					
100 gpm GWETS Skid	$4,956.00	LS	1	$4,956	
2,500 gal. Double Wall Poly Tank	$4,000.00	LS	1	$4,000	
1000 lb. Carbon Vessel - Rental	$2,050.00	LS	1	$2,050	
Carbon Removal and Treatment	$1,060.00	LS	1	$1,060	
Carbon Profile (assumes haz)	$170.00	LS	1	$170	
Laboratory Analysis	$175.00	LS	1	$175	
Well Installation	$1,375.00	well	6	$8,250	
Drums and Soil Disposal (non-haz.)	$145.00	well	3	$435	
Piping and Connections	$35.00	foot	350	$12,250	
Generator (Rental)	$200.00	day	7	$1,400	
LFR Field Activities and Equipment	$9,472.00	LS	1	$9,472	
Groundwater Extraction, Air Stripping and Vapor Adsorption					
250 gpm GWETS Skid	$10,000.00	LS	1	$10,000	
2,500 gal. Double Wall Poly Tank	$4,600.00	LS	1	$4,600	
Mobilization & Installation (GWETS)	$2,820.00	LS	1	$2,820	
Equipment Service	$250.00	month	12	$3,000	
1000 lb. Carbon Vessel	$3,500.00	vessel	2	$7,000	
Carbon Initial Fill - Air	$1,000.00	vessel	2	$2,000	
Turn Key Carbon - Air: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	4	$8,000	
Carbon Profile - Air (non-haz)	$360.00	change	8	$2,880	
Driller Mob. & Decon.	$375.00	LS	1	$375	
Well Installation	$1,375.00	well	57	$78,375	
Drum & Soil Disposal (non-haz)	$100.00	well	15	$1,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$2,500.00	month	12	$30,000	
Piping and Connections	$35.00	foot	5700	$199,500	
Laboratory Analysis NPDES (Annual)	$5,000.00	LS	1	$5,000	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Air Stripping Tower (Complete Unit)	$125,000.00	LS	1	$125,000	
Mobilization & Installation (Air Stripper)	$12,500.00	LS	1	$12,500	
Vapor Phase Adsorption Reactors (Rental)	$4,000.00	month	12	$48,000	
Vapor Phase Adsorption Matrix	$13,367.00	LS	1	$13,367	
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
Mobilization and Installation	$2,750.00	LS	1	$2,750	
Air Stripping Conveyance Pipe and Fittings	$35.00	foot	100	$3,500	
Laboratory Analysis	$150.00	LS	24	$3,600	
LFR Field Activities and Equipment	$18,512.00	LS	1	$18,512	
Sub-total					**$832,861**
Source Soil Removal and Ex-situ SVE					
Remedial Action Preparation					

LABOR & DIRECT COSTS:			**Alternative 4**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$63,175	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound & Manifold	$2,500.00	LS	1	$2,500	
HDPE Liner	$2.00	sq. ft	128200	$256,400	
Permitting					
SVE - VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
VCAPCD SVE System Operation Permit	$5,000.00	LS	1	$5,000	
Source Removal					
Contaminated Soil Excavation	$2.50	cy	189720	$474,300	
Ex-Situ SVE					
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
1000 lb. Carbon Vessel	$3,500.00	LS	2	$7,000	
Mobilization and Installation	$8,920.00	LS	1	$8,920	
Equipment Service	$250.00	month	12	$3,000	
Carbon Initial Fill	$1,000.00	vessel	2	$2,000	
Turn Key Carbon: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	8	$16,000	
Carbon Profile (non-haz)	$360.00	change	8	$2,880	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$1,500.00	month	12	$18,000	
SVE Conveyance Pipe and Fittings	$35.00	foot	900	$31,500	
Soil Replacement	$2.50	cy	18972	$47,430	
Mobile Laboratory	$300,000.00	LS	1	$300,000	
Laboratory Analysis	$150.00	LS	24	$3,600	
LFR Field Activities	$20,160.00	LS	1	$20,160	
Sub-total					**$1,326,665**
Affected Soil and Sludge Excavation and Treatment with Sonic Technologies					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$3,482,644	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound Insatallation	$2,500.00	LS	1	$2,500	
Permitting					
SVE - VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
Remediation Implementation Permitting	$20,000.00	LS	1	$20,000	
Soil Excavation and Sonic Treatment					
Contaminated Soil Excavation	$2.50	cy	198630	$496,575	
Mobilization and Installation	$10,000.00	LS	1	$10,000	
Sonic Technology Treatment	$300.00	cy	198630	$59,589,000	
Soil Replacement	$1.50	cy	198630	$297,945	
LFR Field Activities	$141,403.00	LS	1	$141,403	
Sub-total					**$64,050,367**
Affected Soil Consolidation and Biotreatment					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$103,332	
Permitting					
VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
Soil Consolidation and Bio-treatment					
Impacted Soil Excavation and Placement	$2.50	cy	66400	$166,000	
Bio-treatment Amendments and Nutrients	$6.00	cy	66400	$398,400	
Biological Parameters Sampling and Analysis	$250.00	LS	10	$2,500	
Analytical Sampling and Analysis	$150.00	sample	10	$1,500	
Various Soil Movement for Implementation	$1.50	cy	983000	$1,474,500	
LFR Field Activities	$15,250.00	LS	1	$15,250	
Sub-total					**$2,169,982**
Affected Soil Capping					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	

LABOR & DIRECT COSTS:			**Alternative 4**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$83,728	
Permitting					
Grading Permit	$5,000.00	LS	1	$5,000	
Soil Capping					
Cap Material Placement - Both RPAs	$2.50	cy	279700	$699,250	
Confirmation Sampling	$150.00	sample	50	$7,500	
Re-vegetation	$32,000.00	acre	29	$928,000	
LFR Field Activities	$31,328.00	LS	1	$31,328	
Sub-total					**$1,758,306**
Fencing and Deed Restrictions					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$29,715	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
Permit to Construct	$5,000.00	LS	1	$5,000	
Fencing and Deed Restrictions					
Milk Vetch Area Fencing	$55.00	ft	1100	$60,500	
RPA Area Fencing	$55.00	ft	9250	$508,750	
LFR Field Activities	$14,750.00	LS	1	$14,750	
Sub-total					**$624,015**
Monitored Natural Attenuation					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$7,435	
Permitting					
Well Installation - GW Monitoring	$1,375.00	well	10	$13,750	
Well Abandonment	$275.00	LS	27	$7,425	
Groundwater Monitoring					
Drums	$45.00	drum	202.5	$9,113	
GW Disposal (non-haz)	$65.00	drum	202.5	$13,163	
Laboratory Analysis	$150.00	well	270	$40,500	
Groundwater Monitoring Well Abandonment	$28.00	well	27	$756	
LFR Field Activities	$60,480.00	LS	1	$60,480	
Sub-total					**$156,121**
Reporting					
Installation Report	$2,500.00	report	7	$17,500	
Quarterly	$3,500.00	report	4	$14,000	
Semi-annually	$4,500.00	report	10	$45,000	
Post Remediation	$7,500.00	report	7	$52,500	
Site Closure	$10,000.00	report	1	$10,000	
Sub-total					**$139,000**
Project Management					
Project Oversight and Coordination	10%		1	$7,105,732	
Sub-total					**$7,105,732**
TASK SUB-TOTALS					**$78,163,049**
Indirect Reimbursable Expenses Cost Mark Up (10%)					**$7,816,305**
Communication Fee (2.4%)					**$1,875,913**
PROJECT COSTS					**$87,855,267**

LABOR & DIRECT COSTS:			**Alternative 4**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
CONTINGENCY COST - 30%					**$26,356,580**
TOTAL PROJECT COST					**$114,211,847**

Assumptions

Groundwater Extraction, Air Stripping and Vapor Adsorption
Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.
6. A fenced, bermed, concrete treatment compound will be installed to house remediation equipment.

Permitting

1. Well permits are $333 for the first well and $158 for each additional well. It is assumed that 113 wells will be installed.
2. A VCAPCD equipment operation permit is required for the Air stripper and vapor adsorption system.
3. NPDES permit is necessary for water discharge.
4. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Pilot Testing - AS/SVE

1. Groundwater extraction equipment is rented for the pilot study and includes mob. and demob.
2. Tanks for water storage is rented for the pilot study and includes mob. And demob.
3. One 1000 pound absorber will be utilized per VCAPCD permit.
4. Carbon will need to be removed, profiled and treated at conclusion of pilot test.
5. A total of 6 groundwater extraction wells will be installed for the pilot test.
6. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
7. Each drum requires profiling prior to disposal.
8. Approx. 350 ft of above ground conveyance piping will be utilized to connect the wells to the system.
9. Power to run the pilot test will be obtained from a rented, portable generator.
10. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for

Groundwater Extraction, Air Stripping and Vapor Adsorption

1. Groundwater extraction, stripping and vapor adsorption will occur for a total of 1 year.
2. A groundwater extraction sytem will be purchased and equipment needs servicing once per quarter.
3. A water storage tank will be located on site.
4. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
5. A total of 57 new groundwater extraction wells (incl. pilot study wells) will be installed.
6. Each well installation will produce approx. 0.5 drums of soil for non-haz. disposal.
7. Each drum requires profiling prior to disposal.
8. Electrical usage is based on motor HP and electricity costs approximately $0.14 per kw-h.
9. The SVE system will run 24 hr. a day, in a 30 day month.
10. Aboveground conveyance piping will be used to connect the wells to the treatment system.
11. NPDES laboratory analysis is based on one well sample per quarter. These will be analyzed via approved EPA Method.
12. The sir stripper unit and controls will be all inclusive.
13. Mobilization and installation of the air stripper is estimated at 10% of the cost of the unit.
14. Biological vapor phase adsorption reactors will be rented.
15. A supplemental blower package will be used to distribute air through the vapor treatment system.
16. Aboveground conveyance piping will be used to connect the stripper to the vapor treatment system.
17. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via an
18. LFR field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per

Source Soil Removal and Ex-situ SVE
Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to excavation.
6. A treatment compound will be established to accommodate the excavated soil and remediation equipment.
7. The treatment compound will be lined with HDPE liner.

Permitting

1. An excavation permit will be obtained from VCAPCD prior to excavation.
2. A VCAPCD equipment operation permit is required for the ex-situ SVE system.

Source Removal

1. Contaminated soil will be excavated and placed in the treatment area.

Ex-situ SVE

1. The SVE system will be operated for a total of 1 year or until contaminant levels become asymptotic.

2. SVE equipment needs servicing once per quarter.
3. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
4. A total of 113 new dual nested AS/SVE wells (incl. pilot study wells) will be installed.
5. Electrical usage is based on motor HP and electricity costs approximately $0.14 per kw-h.
6. The SVE system will run 24 hr. a day, in a 30 day month.
7. A network of conveyance piping will be used to connect to the treatment system.
8. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via an
9. A mobile laboratory will be on-site for confirmation sampling.
10. Soil will be replaced to an appropriate location at the conclusion of ex-situ SVE.
11. LFR field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per

Affected Soil and Sludge Excavation and Treatment with Sonic Technologies
Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to excavation.
6. A treatment compound will be established to accommodate the excavated soil and remediation equipment.

Permitting

1. An excavation permit will be obtained from VCAPCD prior to excavation.
2. A VCAPCD equipment operation permit is required for the ex-situ SVE system.

Soil Excavation and Sonic Treatment

1. Impacted soil will be excavated and placed in the treatment area.
2. Sonic treatment technology includes remediation equipment and operation of the technology by the licensing company.
3. Treated soil will be placed back on-site.
4. LFR field time during operation and sampling includes 1 technician for 200 days of oversight and sampling.

Affected Soil Consolidation and Biotreatment
Remedial Action Prepartaion

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.

Permitting

1. An excavation permit will be obtained from VCAPCD prior to excavation.

Soil Consolidation and Biotreatment

1. Impacted soil will be excavated and placed in the soil consolidation area.
2. Nutrients and amendments will be mixed with the soil during excavation. This will also act as vapor suppressant.
3. Biological parameters will be monitored to assess microbiological viability.
4. Sampling will be performed to confirm contaminant reduction.
5. LFR field time during excavation and sampling includes 1 technician for oversight and sampling once per week.

Affected Soil Capping
Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.

Permitting

1. A grading permit is required prior to implementation.

Soil Capping

1. The entire area (both RPAs) to be capped will be cleared and grub prior to import of clean cap soils.
2. Clean imported fill cap material will be purchased from offsite and replaced onsite.
3. Confirmation sampling will occur to provide assurance that imported cap material is clean.
4. The capped area will be re-vegetated with 50% indigineous and 50% non-indigineous plants.
5. LFR field time during operation includes 1 technician for 2 months for oversight and sampling.

Fencing and Deed Restrictions

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting

1. Permits to erect a fence will be obtained prior to installation.

Fencing and Deed Restrictions

1. The permanent fence will consist of 8 ft high chain link fence covered in black vinyl for asthetic purposes.
2. Both the milk vetch protection aarea and both RPA perimeters will be fenced.
3. LFR field time during installaton includes 1 technician for 2 weeks of oversight.

Monitored Natural Attenuation

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting

1. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Groundwater Monitoring

1. Monitored natural attenuation is estimated to continue for 5 years.
2. Groundwater monitoring will continue for 5 years.
3. A total of 27 groundwater monitoring wells will be monitored.
4. Each well will produce approx. 0.75 drums of purge water for non-haz. disposal.
5. Each drum requires profiling prior to disposal.
6. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for 4.5 days.
5. All report will be submitted to the appropriate agency after review from Bodycote.

Reporting

1. An installation report will be submitted to the appropriate agencies.
2. Quarterly and semi-annual treatment system and groundwater monitoring reports will be submitted to the appropriate
3. A post-remediation reporting will be submitted to the appropriate agencies.
4. A site closure report will be submitted to the appropritae agencies upon completion of remediation.
5. All report will be submitted to the appropriate agency after review from clients.

Project Management

1. Includes client interface, cost tracking, RWQCB and SCAQMD interface, overall coordination and scheduling, budgeting, and sub-contractor management. Estimated at 10% of project cost.

TABLE FS-3e
Total Cost Summary Table

Alternative 5 - Source Removal; Enhanced Bioremediation; Affected Soil and Sludge Excavation and Disposal
002-10261-00

LABOR & DIRECT COSTS:			**Alternative 5**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Source Soil Removal and Ex-situ SVE					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$66,333	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Treatment Compound Installation	$2,500.00	LS	1	$2,500	
HDPE Liner	$2.00	sq. ft	128200	$256,400	
Permitting					
SVE - VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
De-watering Permit (NPDES)	$5,000.00	LS	1	$5,000	
Source Removal					
Contaminated Soil Excavation	$2.50	cy	189720	$474,300	
Ex-Situ SVE					
300 SCFM Blower Skid	$50,000.00	LS	1	$50,000	
1000 lb. Carbon Vessel	$3,500.00	LS	2	$7,000	
Mobilization and Installation	$8,920.00	LS	1	$8,920	
Equipment Service	$250.00	month	12	$3,000	
Carbon Initial Fill	$1,000.00	vessel	2	$2,000	
Turn Key Carbon: Vac., Re-bed, & Disposal (non-haz)	$2,000.00	change	8	$16,000	
Carbon Profile (non-haz)	$360.00	change	8	$2,880	
Electrical Power Pole	$2,500.00	LS	1	$2,500	
Electrical/Equipment Connections	$2,000.00	LS	1	$2,000	
Electrical Usage	$1,500.00	month	12	$18,000	
SVE Conveyance Pipe and Fittings	$35.00	foot	900	$31,500	
Soil Replacement	$2.50	cy	18972	$47,430	
Mobile Laboratory	$300,000.00	LS	1	$300,000	
Laboratory Analysis	$150.00	LS	24	$3,600	
LFR Field Activities	$20,160.00	LS	1	$20,160	
Sub-total					**$1,329,823**
Enhanced Bioremediation (HRC Injection)					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$61,422	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
Injection Permit	$5,000.00	LS	1	$5,000	
HRC Injections					
Direct Push Injection	$195.00	injection	1600	$312,000	
HRC Material	$5.25	lb	120000	$630,000	
Shipping Fees and Tax (HRC Material)	10%	LS	1	$63,000	
Laboratory Analysis	$150.00	sample	68	$10,200	
LFR Field Activities	$42,720.00	LS	1	$42,720	
Sub-total					**$1,129,642**
Hazardous Soil Excavation and Disposal					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	5%	LS	1	$1,299,084	
Underground Utility Locator	$1,800.00	day	1	$1,800	
Permitting					
VCAPCD Excavation Permit	$5,000.00	LS	1	$5,000	
Hazardous Soil Excavation and Disposal					
Clear and Grub	$310.00	acre	60	$18,600	
Contaminated Soil Excavation	$5.00	cy	416980	$2,084,900	

LABOR & DIRECT COSTS:			**Alternative 5**		**TOTAL**
ITEM	Rate	Units	# of Units	Extended	Cost
Soil Disposal - RCRA Haz.	$133.00	cy	5000	$665,000	
Soil Disposal - non-RCRA Haz.	$55.00	cy	416980	$22,933,900	
De-watering	$100,000.00	LS	1	$100,000	
Clean Imported Soil and Replacement	$15.00	cy	5000	$75,000	
LFR Field Activities	$93,984.00	LS	1	$93,984	
Sub-total					**$27,280,768**
Monitored Natural Attenuation					
Remedial Action Preparation					
Workplan Preparation - Remedial Action	$2,500.00	LS	1	$2,500	
Health and Safety Plan Amendment	$1,000.00	LS	1	$1,000	
System Design and Engineering	15%	LS	1	$7,435	
Permitting					
Well Installation - GW Monitoring	$1,375.00	well	10	$13,750	
Well Abandonment	$275.00	LS	27	$7,425	
Groundwater Monitoring					
Drums	$45.00	drum	202.5	$9,113	
GW Disposal (non-haz)	$65.00	drum	202.5	$13,163	
Laboratory Analysis	$150.00	well	270	$40,500	
Groundwater Monitoring Well Abandonment	$28.00	well	27	$756	
LFR Field Activities	$60,480.00	LS	1	$60,480	
Sub-total					**$156,121**
Reporting					
Installation Report	$2,500.00	report	4	$10,000	
Quarterly	$3,500.00	report	4	$14,000	
Semi-annually	$4,500.00	report	10	$45,000	
Post Remediation	$7,500.00	report	4	$30,000	
Site Closure	$10,000.00	report	1	$10,000	
Sub-total					**$109,000**
Project Management					
Project Oversight and Coordination	10%		1	$3,000,535	
Sub-total					**$3,000,535**
TASK SUB-TOTALS					**$33,005,889**
Indirect Reimbursable Expenses Cost Mark Up (10%)					**$3,300,589**
Communication Fee (2.4%)					**$792,141**
PROJECT COSTS					**$37,098,620**
CONTINGENCY COST - 30%					**$11,129,586**
TOTAL PROJECT COST					**$48,228,206**

Assumptions

Source Soil Removal and Ex-situ SVE
Remedial Action Prepartaion
1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to excavation.
6. A treatment compound will be established to accommodate the excavated soil and remediation equipment.
7. The treatment compound will be lined with HDPE liner.

Permitting
1. An excavation permit will be obtained from VCAPCD prior to excavation.
2. A VCAPCD equipment operation permit is required for the ex-situ SVE system.

Source Removal
1. Contaminated soil will be excavated and placed in the treatment area.

Ex-situ SVE
1. The SVE system will be operated for a total of 1 year or until contaminant levels become asymptotic.
2. SVE equipment needs servicing once per quarter.
3. Each carbon vessel will be changed semi-annually and requires profiling prior to disposal.
4. A total of 113 new dual nested AS/SVE wells (incl. pilot study wells) will be installed.
5. Electrical usage is based on motor HP and electricity costs approximately $0.14 per kw-h.
6. The SVE system will run 24 hr. a day, in a 30 day month.
7. A network of conveyance piping will be used to connect to the treatment system.
8. VCAPCD laboratory analysis is based on one carbon influent and effluent sample per month. These will be analyzed via an approved EPA Method.
9. A mobile laboratory will be on-site for confirmation sampling.
10. Soil will be replaced to an appropriate location at the conclusion of ex-situ SVE.
11. LFR field time during operation and sampling includes 1 technician for 4 hours of sampling and routine maintenance per

Enhanced Bioremediation (HRC Injection)
Remedial Action Prepartaion
1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to excavation.

Permitting
1. Injection permits are $333 for the first well and $158 for each additional well. It is assumed that 1600 wells will be installed.

HRC Injections
1. The on-site area for HRC application was determined as the area of impact. This was an irregular shape with a total area of 160000 sq. ft.
2. The treatment thickness was 15 ft.
3. HRC is applied at a dose of 5 lbs/ft.
4. Shipping and Taxes are 10% of the total cost of the HRC material.
5. LFR field time during operation and sampling includes 1 technician for 2 months for oversight and sampling.

Hazardous Soil Excavation and Disposal
Remedial Action Prepartaion
1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
4. System design and engineering includes LFR staff time and effort.
5. A private underground utility locator will be utilized prior to well installation.

Permitting
1. A VCAPCD excavation permit is required.

Hazardous Soil Excavation and Disposal
1. De-watering will be necessary prior to excavation and is based on a lump sum provided by a contractor.

2. The areas excavation will be cleared and grubbed prior to excavation.
3. Soil will be excavated and disposed of at a licensed disposal facility.
4. 75% of excavated soil will be hazardous (for disposal purposes) and 25% will be considered non-hazardous.
5. Clean imported fill will be purchased from offsite and replaced onsite.
6. LFR Field time includes 1 technician for 4.5 months for oversight and sampling.

Monitored Natural Attenuation

Remedial Action Preparation

1. Workplan preparation includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.
2. Workplan will be submitted to appropriate agencies following client review.
3. HSP amendment includes LFR staff time and effort (Draft and Final Write-up, CAD, Editing, Repro., etc.), and assumes it is necessary prior to beginning remediation activities.

Permitting

1. All wells will be abandoned in accordance with agency regulations at the completion of remediation.

Groundwater Monitoring

1. Monitored natural attenuation is estimated to continue for 5 years.
2. Groundwater monitoring will continue for 5 years.
3. A total of 27 groundwater monitoring wells will be monitored.
4. Each well will produce approx. 0.75 drums of purge water for non-haz. disposal.
5. Each drum requires profiling prior to disposal.
6. LFR field activities include equipment rentals (PID, anemometers, manometers, etc.), mileage and LFR staff time on-site for 4.5 days.
5. All report will be submitted to the appropriate agency after review from Bodycote.

Reporting

1. An installation report will be submitted to the appropriate agencies.
2. Quarterly and semi-annual treatment system and groundwater monitoring reports will be submitted to the appropriate
3. A post-remediation reporting will be submitted to the appropriate agencies.
4. A site closure report will be submitted to the appropritae agencies upon completion of remediation.
5. All report will be submitted to the appropriate agency after review from clients.

Project Management

1. Includes client interface, cost tracking, RWQCB and SCAQMD interface, overall coordination and scheduling, budgeting, and sub-contractor management. Estimated at 10% of project cost.